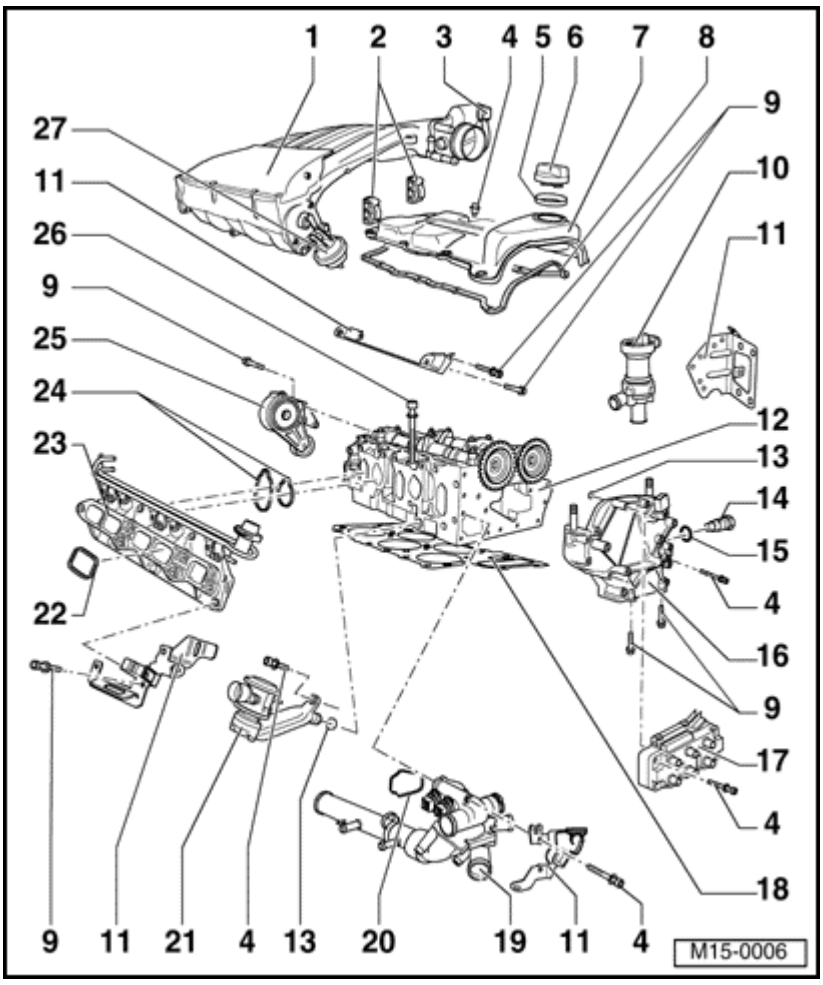
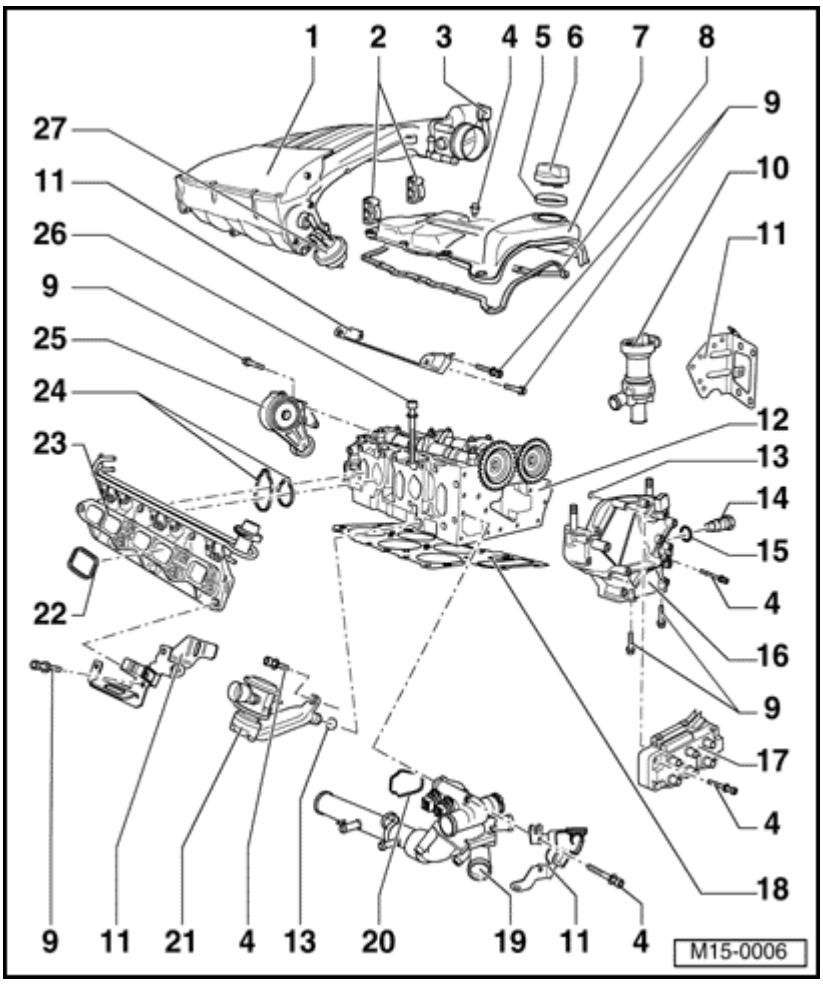
Cylinder head, removing and installing
Compression pressure, checking
Cylinder head cover, removing and installing
Cylinder head, removing and installing
Valve gear, repairing
Camshafts, removing and installing
Checking hydraulic lifters
Valve guides, checking
Valve guides, replacing
Valve seats, finishing
Valve stem seals, replacing



Checking compression ⇒ page 15-23.

Notes:

- *Use only the assembly tool T10029 for connecting and disconnecting the spark plug connector.*
- *When installing a replacement cylinder head with installed camshafts, the contact areas between the valve lifter and the cam track must be oiled after installing the head.*
- *The supplied plastic open valve protectors should only be removed immediately before mounting the cylinder head.*
- *When replacing the cylinder head, all of the coolant must be replaced.*



1 - Intake manifold-upper

- Removing and installing ⇒ page 15-8
- First, tighten at lower half of manifold, then tighten at both supports
- Disassembling and assembling:

⇒ **Repair Manual, *2.8 Liter VR6 OBD II Fuel Injection & Ignition* , Repair Group 24**

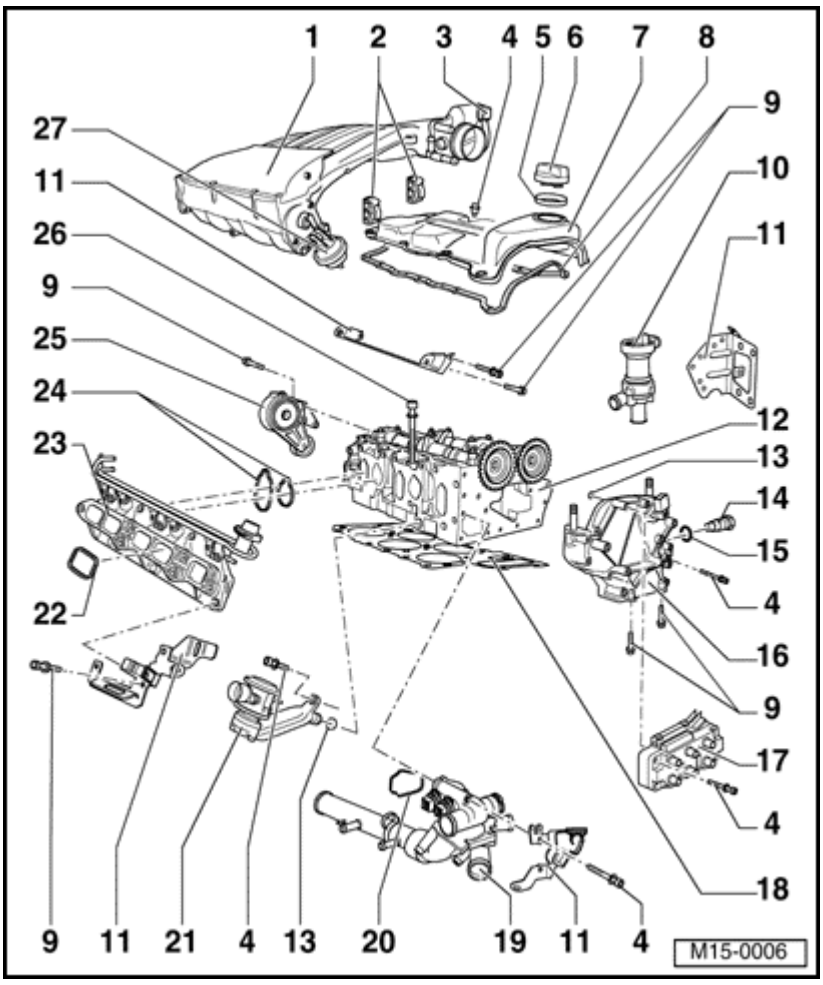
2 - Retainer

- For fuel lines

3 - Throttle with control unit (J338)

- May not be opened
- With throttle acceleration (G186)
- With angle transmitter -1- for throttle acceleration (G187)
- With angle transmitter (2) for throttle acceleration (G188)
- Heated by coolant
- Removing and installing:

⇒ **Repair Manual, *2.8 Liter VR6 OBD II Fuel Injection & Ignition*, Repair Group 24**



4 - 10 Nm

5 - Profile gasket

6 - Gasket cover

- Replace gasket if damaged

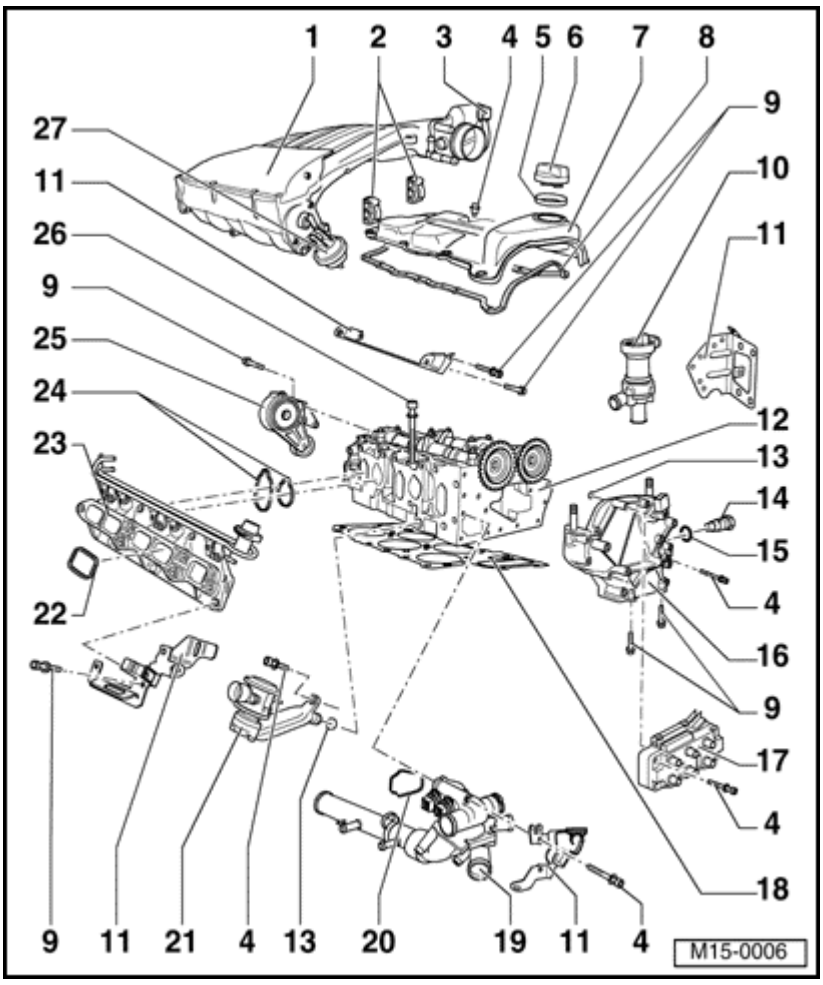
7 - Cylinder head cover

- Removing and installing ⇒ page 15-8
- Replace if damaged or leaking
- Coat with D 454 300 A3 before placing the connections cover/cylinder head and the half moon shaped recess

8 - Gasket for cylinder head cover

- Replace if damaged
- Note installation position

9 - 25 Nm



10 - Coolant return pump (V51)

- Checking ⇒ page 19-24

11 - Retainer

12 - Cylinder head

- Check for distortion ⇒ Fig. 1
- Removing and installing ⇒ page 15-15
- After replacing, replace all of the coolant

13 - O-Ring

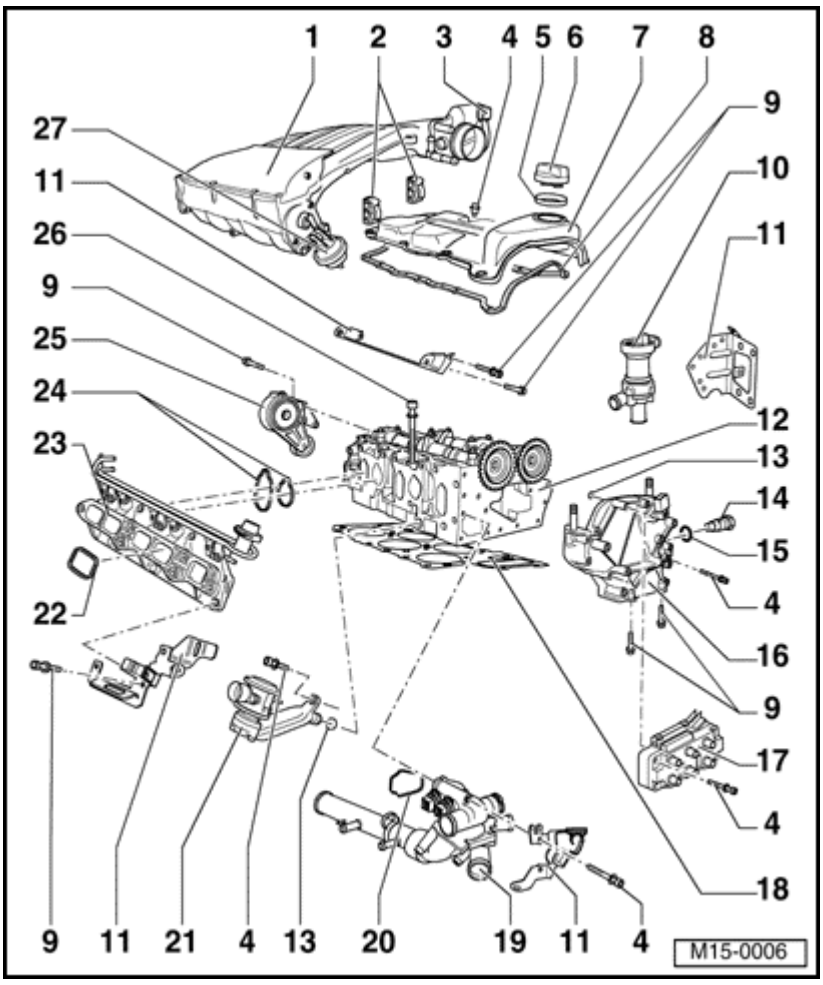
- Replace

14 - Chain tensioner, 40 Nm

- For camshaft roller chain
- Turn engine only with installed chain tensioner

15 - Seal ring

- Replace



16 - Cover

- Can be removed and installed with the cylinder head installed
- Coat sealing surfaces with AMV 188 001 02
- If only the cover has been removed, prepare the cylinder head gasket for installation ⇒ Fig. 2

17 - Ignition coil (N152)

- Checking:

⇒ **Repair Manual, *2.8 Liter VR6 OBD II Fuel Injection & Ignition*, Repair Group 01**

18 - Cylinder head gasket

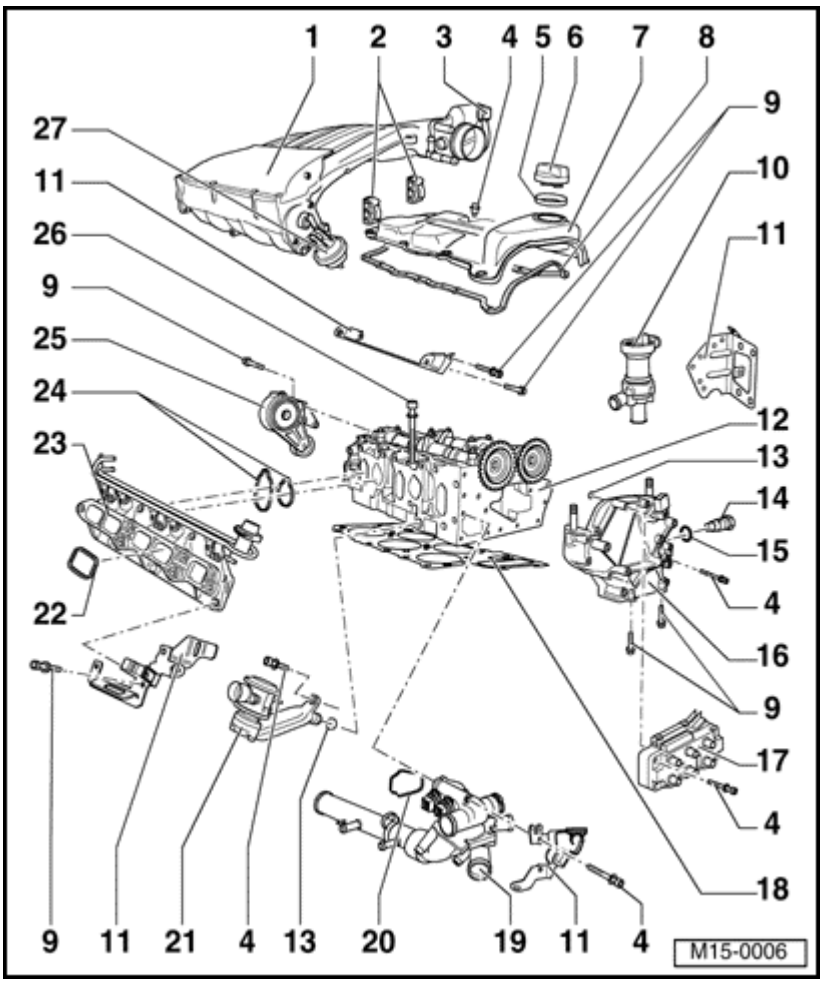
- Replace
- After replacing, replace all of the coolant
- Metal gasket

19 - Thermostat housing

- Disassembling and assembling ⇒ page 19-13

20 - Seal

- Replace



21 - Combination valve

- Checking page 26-21
- Removing and installing page 26-31

22 - Seal-upper intake manifold

- Replace if damaged

23 - Intake manifold-lower

24 - Seal-lower intake manifold

- Replace if damaged

25 - Tensioner

- For V-ribbed drive belts

26 - Cylinder head screw

- Replace
- Note assembly instructions and order when loosening or tightening page 15-15

27 - Vacuum actuator

- For switching of intake manifold runner

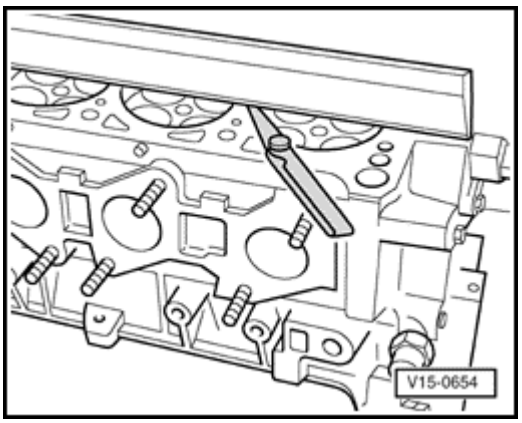


Fig. 1 Checking cylinder head for distortion

Special tools, equipment, test and inspection devices; required accessories

- Feeler gauge

Max. allowable distortion: 0.1 mm

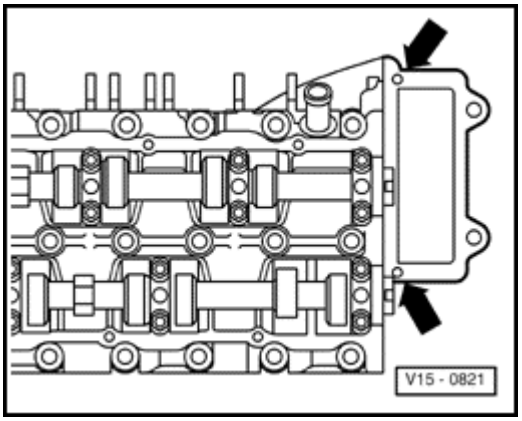


Fig. 2 Preparing cylinder head gasket for installation

Special tools, equipment, test and inspection devices; required accessories

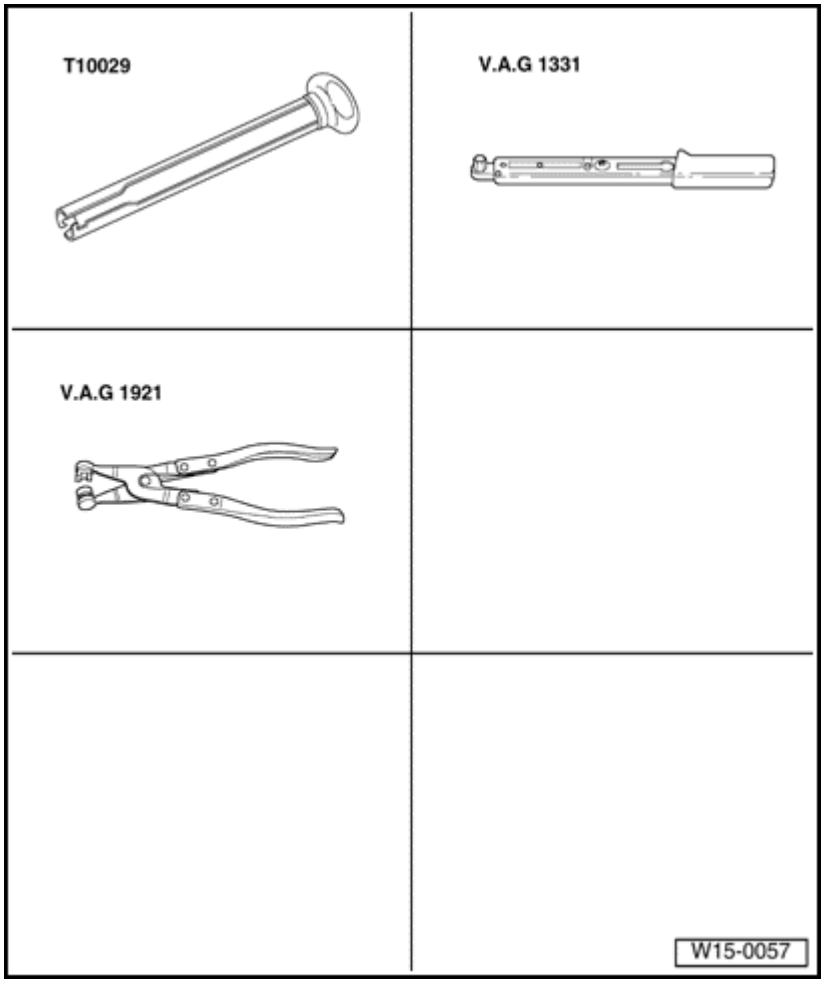
- Sealant AMV 188 001 02

- Clean the 3 mm bores in the cylinder head gasket or cover and sealing flange of old sealant -arrows-.
- Fill the 3 mm bore in the cylinder head gasket with sealant AMV 188 001 02 and coat the sealing surfaces on the cover and sealing flange with sealant.

Notes:

With the cylinder head installed, the bores in the cylinder head gasket are only partially visible.

Cylinder head cover, removing and installing



Special tools, equipment, test and inspection devices; required accessories

- Installation tool T10029
- Torque wrench V.A.G 1331 (5-50 Nm)
- Spring band clamp pliers V.A.G 1921

Removing

Notes:

The ground strap must be disconnected for this procedure. Check to see if a coded radio is installed. If that is the case, you must first obtain the anti-theft code.

- With the ignition off, disconnect the battery ground strap.
- During installation you must reinstall at the same locations all tie straps that were loosened or cut during removal.
- Remove the spark plug connector with installation tool T10029 and unclip the ignition lines:

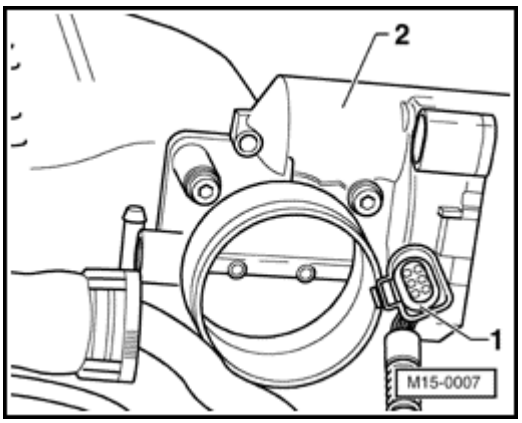
⇒ **Repair Manual, *2.8 Liter VR6 OBD II Fuel Injection & Ignition* , Repair Group 28**

- Remove the engine cover.

⇒ **Repair Manual, *2.8 Liter VR6 OBD II Fuel Injection & Ignition* , Repair Group 28**

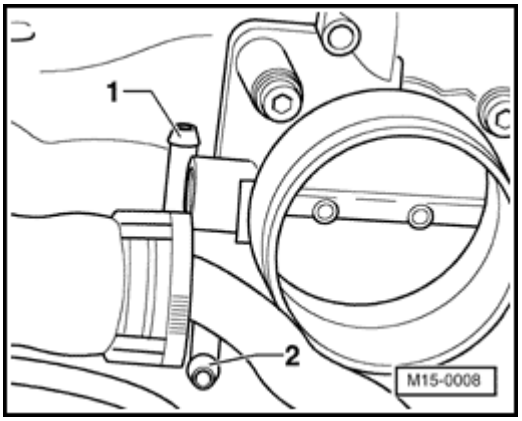
- Disconnect the connector from the heating resistor (N79).
- Remove the inlet hose between the air flow sensor (G70) and the throttle control unit (J338).

⇒ **Repair Manual, *2.8 Liter VR6 OBD II Fuel Injection & Ignition* , Repair Group 24**



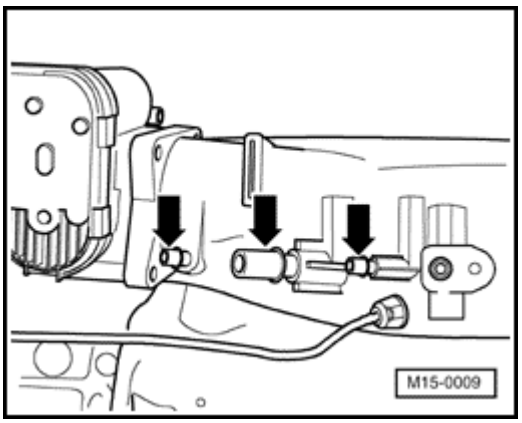
A

- Disconnect connector -1- from the throttle control unit -2.
- Unscrew the ground connection at the throttle control unit (J338).
- Open and close the balancing reservoir sealing cover to allow pressure to escape from the cooling system.

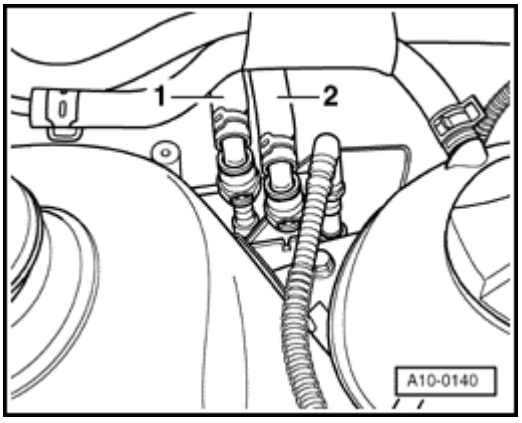


A

- Remove the coolant hoses -1- and -2- from the throttle control unit and plug the hose ends.
- Unclip the fuel lines at the cylinder head cover.



- Now disconnect the vacuum connectors -arrows-.
- Unclip the secondary air pump inlet line and all other lines out of the brackets at the top half of the intake manifold.
- Unscrew the dipstick duct at the top half of the intake manifold.
- Now unscrew the two intake manifold support screws.
- Remove the vacuum hose at the intake manifold switching vacuum actuator.



- Disconnect the flow hose -1- (with white marking) and return hose -2- (with blue marking) and catch the leaking fuel with a clean rag.

Notes:

In order to do this, press the tabs at the hose couplings together.

WARNING!

The fuel system is pressurized. Before opening the system, plane a clean rag around the connection. Then reduce pressure by carefully and slowly loosening the connection.

- Plug the lines so that dirt cannot enter the fuel system.

- Remove middle, left and right damping pans:

⇒ **Repair Manual, *Body-Exterior* , Repair Group 50**

- Put the lock carrier into service position:

⇒ **Repair Manual, *Body-Exterior* , Repair Group 50**

Vehicles with air conditioning

- Remove V-ribbed drive belt ⇒ page 13-28.
- Remove A/C compressor:

⇒ **Repair Manual, *Heating & Air Conditioning* , Repair Group 87**

- Unscrew refrigerant line retainer clamp(s).

WARNING!

Do not open the A/C system refrigerant circuit.

Notes:

- *Opening the refrigerant circuit can be done only in shops which have available properly trained personel as well as all of the necessary tools and equipment.*
- *To avoid damage to the condenser, coolant lines and hoses, make sure that the lines and hoses are not being over-stretched, crimped or bent.*

Continued for all vehicles

- Remove the combination valve ⇒ page 26-31

- Next, unscrew the upper intake manifold from the lower intake manifold.
- Remove the upper intake manifold and place it on a suitable surface so that the vacuum actuator will not be damaged.

Notes:

Plug the intake ducts in the lower intake manifold or cylinder head with a clean rag.

- Remove the cylinder head cover.

Installing

The installation takes place in the reverse order.

Notes:

- *If damaged or leaking, replace cylinder head cover.*
- *First, screw the upper intake manifold to the lower intake manifold, then tighten both manifold support screws.*
- *Make sure the fuel hoses are firmly connected.*

- If necessary, refill coolant ⇒ page 19-15.
- Check DTC memory.

⇒ **Repair Manual, *2.8 Liter VR6 OBD II Fuel Injection & Ignition* , Repair Group 01**

- Adjust basic settings.

⇒ **Repair Manual, *2.8 Liter VR6 OBD II Fuel Injection & Ignition* , Repair Group 24**

- Check the readiness code.

⇒ **Repair Manual, *2.8 Liter VR6 OBD II Fuel Injection & Ignition* , Repair Group 01**

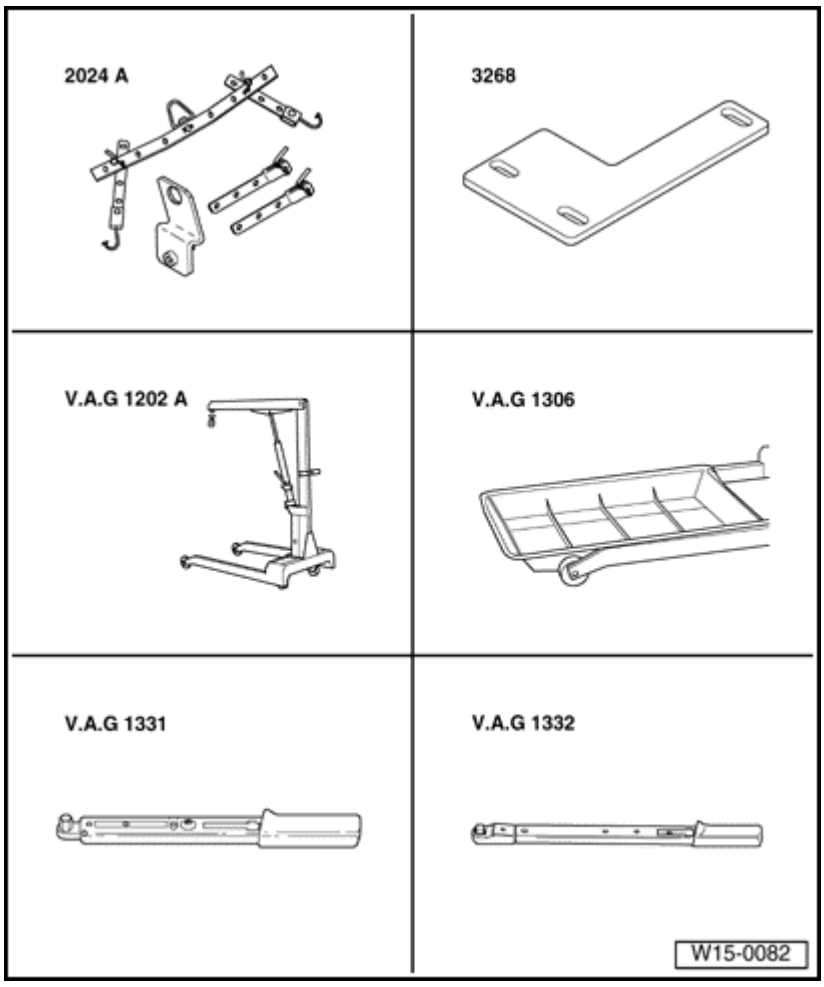
- If the error memory was erased or the engine control unit was disconnected from the positive continuous voltage feed, regenerate the readiness code:

⇒ **Repair Manual, *2.8 Liter VR6 OBD II Fuel Injection & Ignition* , Repair Group 01**

Tightening torque

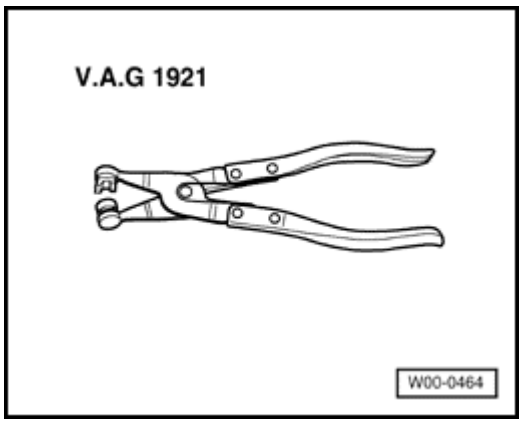
Screw fasteners	Torque
Cylinder head cover to cylinder head	10 Nm
Upper intake manifold to lower intake manifold	25 Nm
Upper intake manifold to support right and left	25 Nm
Upper intake manifold to support at cylinder head	25 Nm

Cylinder head, removing and installing



Special tools, equipment, test and inspection devices; required accessories

- Suspension device 2024 A
- Camshaft ruler 3268
- Shop crane V.A.G 1202 A
- Drip pan V.A.G 1306
- Torque wrench V.A.G 1331 (5-50 Nm)
- Torque wrench V.A.G 1332 (40-200 Nm)



A

- Spring band clamp pliers V.A.G 1921

Prerequisites

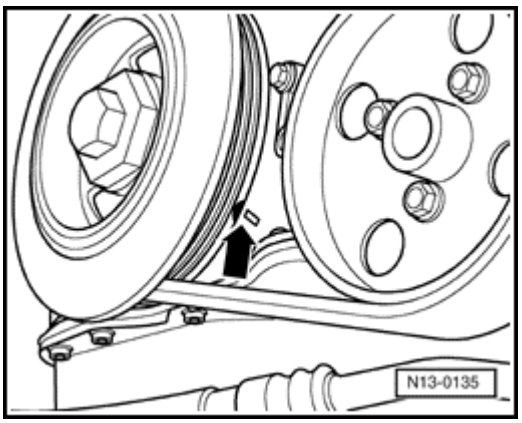
- The engine must not be warmer than hand temperature.

Removing

Notes:

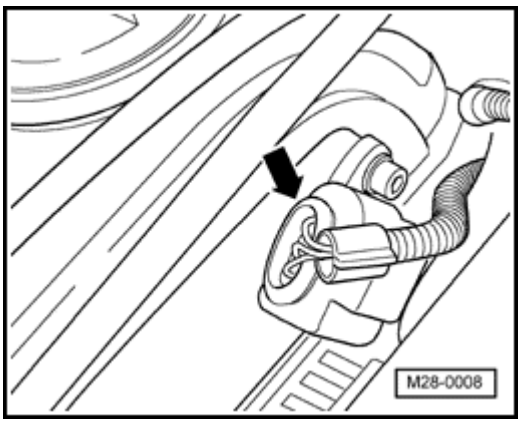
The ground strap must be disconnected for this procedure. Check to see if a coded radio is installed. If that is the case, you must first obtain the anti-theft code.

- With the ignition off, disconnect the battery ground strap.
- Remove the upper half of the intake manifold ⇒ page 15-8.
- Loosen or disconnect the following components:
  - High voltage line from the ignition coil
  - Ground strap at the ignition coil



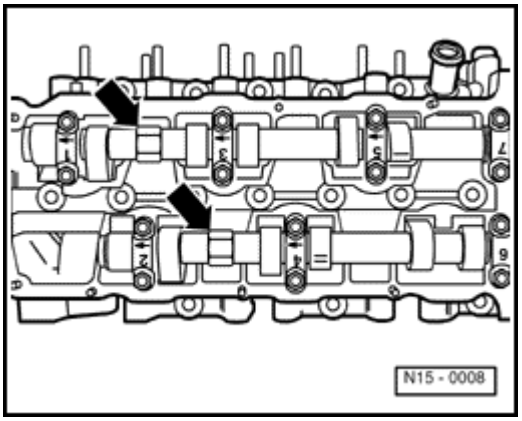
A

- Position crankshaft at the oscillation damper retaining screw in engine cranking direction to marker TDC cyl. 1 -arrow.
- Now drain the coolant ⇒ page 19-15.
- Remove the cylinder head cover.
- Disconnect the injector valve connector and disconnect the vacuum hose from the fuel pressure regulator.
- Loosen the spring band clamps and disconnect the coolant hoses from the thermostat housing.
- Remove the thermostat housing.
- Next, remove the electrical coolant return pump (V51) from its retainer. The coolant hoses may remain connected.



A

- Disconnect the three-wire Hall generator sensor (G40) -arrow-; do not remove the sensor.
- Remove the ignition coil (N152).
- Remove the camshaft roller chain chain tensioner.
- Unscrew the camshaft cover.
- Loosen the camshaft sprockets, however, while doing this, hold the camshafts in place with fork wrench SW24.

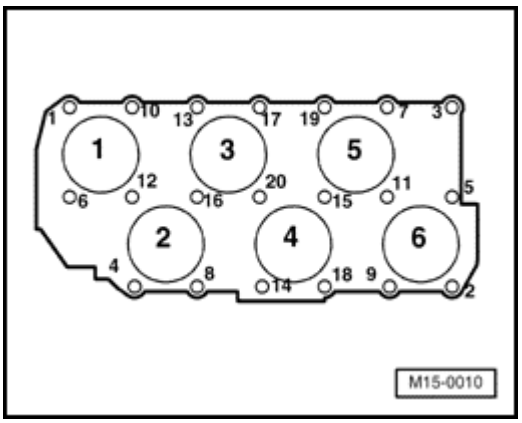


A

Notes:

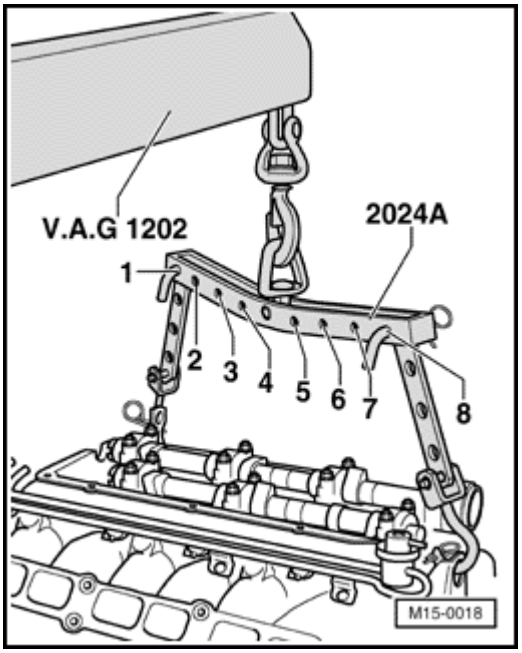
Use only fork wrench SW 24 -arrow- to press against camshaft. Camshaft ruler 3268 cannot be installed when tightening or loosening the sprockets.

- Remove camshaft sprockets.
- Remove the camshaft roller chain track.
- Unscrew the exhaust pipe front from the exhaust manifold ⇒ page 26-1.



A

- Loosen and unscrew the cylinder head screws in the order indicated.



A

- Install suspension device 2024 A as follows and carefully lift the cylinder head with the shop crane.
  - Flywheel side: rail end in position 1
  - Oscillation damper side: rail end in position 8

WARNING!

Use securing clips at hooks and rail retaining pins.

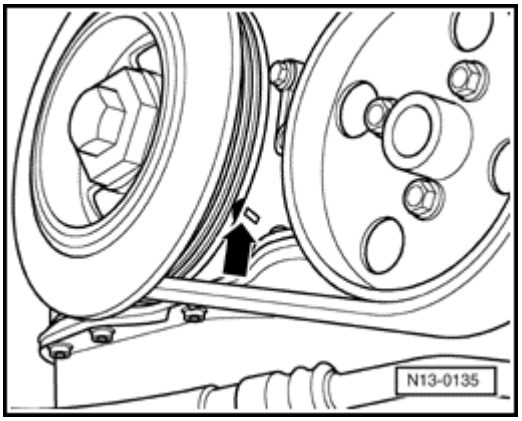
Notes:

- *The bracket markers identified with 1 through 4 point toward the pulley.*
- *The bores in the perforated rails are counted starting from the hook.*

Installing

- Plug the cylinder with clean rags, so that dirt or shavings from sanding cannot enter in between the cylinder face and piston.
- Also avoid letting dirt and shavings from sanding contaminate the coolant.
- Next, carefully clean the cylinder head and cylinder block sealing surfaces. Make sure not to create long grooves or scratches (if you are using abrasive paper, its coarseness must be over 100)
- Carefully remove any grinding and polishing residue as well as all cleaning rags.

If piston cylinder 1 is not in TDC position:



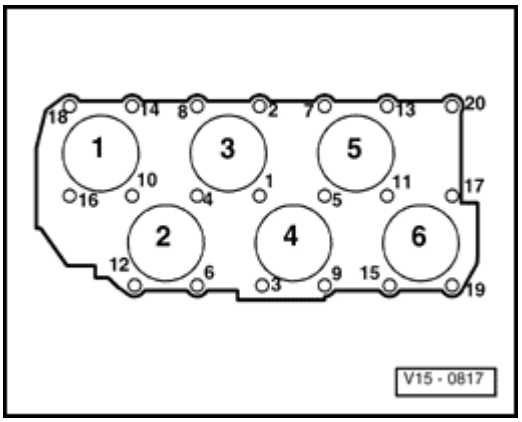
A

- Position crankshaft at the oscillation damper retaining screw in engine cranking direction to marker TDC cyl. 1-arrow.

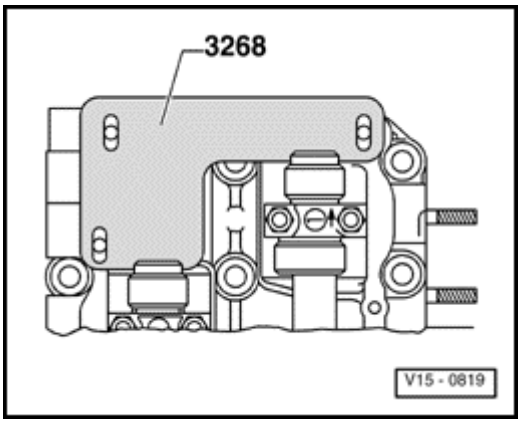
Notes:

- *Do not take the new cylinder head gasket out of its packaging until immediately before installation.*
- *Use extreme care when handling the new gasket. Damage results in leaks.*

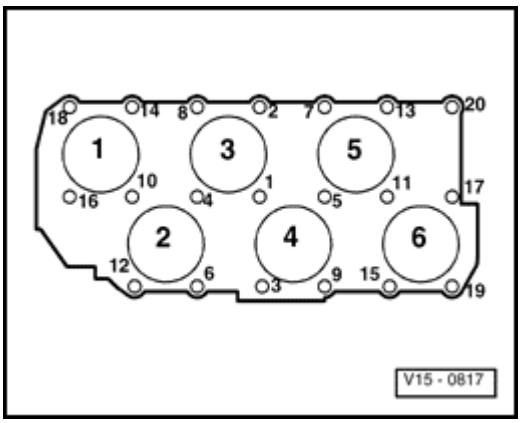
- Position the new cylinder head gasket. You must be able to read the writing (part number) on it.



- Make sure that the fitting sleeves have been seated in cylinder head bolt bores 12 and 20 and that the cylinder head gasket is in place.
- Position the camshafts in the cylinder head to cylinder 1 TDC.



- Fasten camshafts with camshaft ruler 3268.
- Next, prepare the cylinder head gasket for installation ⇒ page 15-7 , Fig. 2.
- Put cylinder head in place, and manually start cylinder head screws.



A

- Tighten cylinder head screws as follows in order shown.
- Next, tighten all screws to 50 Nm.
- Next, turn all screws $^{1}/_{4}$ turn (90°) with a rigid wrench.
- Finally, turn all screws by another $^{1}/_{4}$ turn (90°).

The remaining assembly occurs in reverse order of removal.

Notes:

Make sure that the oil duct seal O-ring is placed into the cover.

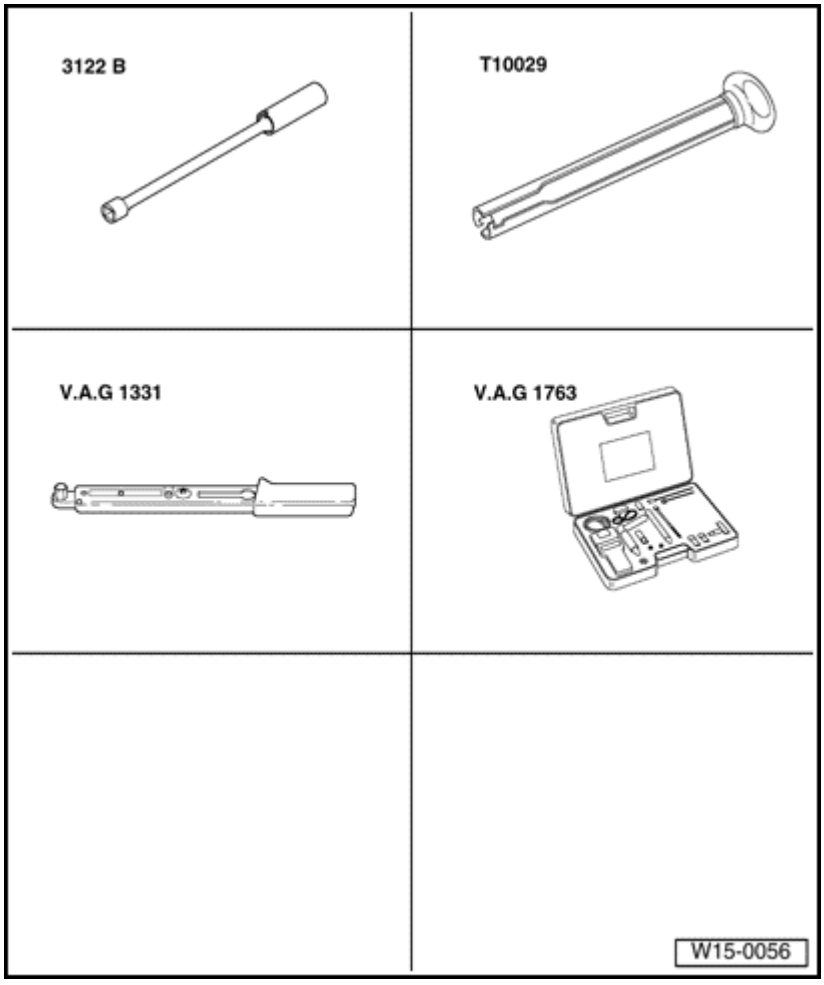
How to adjust the timing ⇒ page 13-10.

How to refill new coolant ⇒ page 19-15.

Notes:

Retightening of the cylinder head screws is not necessary after repairs.

Compression pressure, checking



Special tools, equipment, test and inspection devices; required accessories

- Spark plug wrench 3122 B
- Assembly tool T10029
- Torque wrench V.A.G 1331 (5-50 Nm)
- Compression pressure tester V.A.G 1763

Test condition

- Engine oil temperature must be at least 30 ° C.
- Battery voltage must be at least 11.5 V.

Test procedure

- Disconnect the connector from the heating resistor (N79) and remove the intake hose between the upper half of the air filter and the throttle control unit (J338) together with the crankcase purge valve:

⇒ **Repair Manual, *2.8 Liter VR6 OBD II Fuel Injection & Ignition* , Repair Group 24**

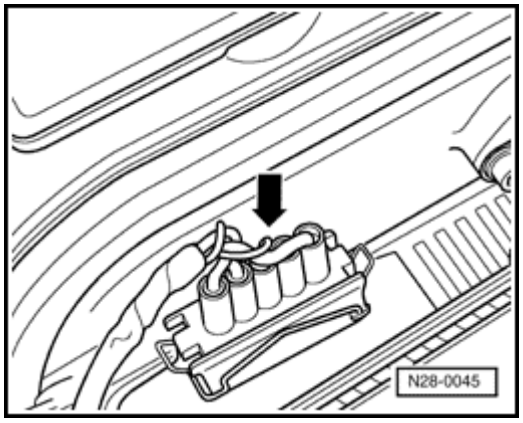
- Use assembly tool T10029 to remove the spark plug connector and the ignition lines:

⇒ **Repair Manual, *2.8 Liter VR6 OBD II Fuel Injection & Ignition* , Repair Group 28**

- Remove the engine cover.

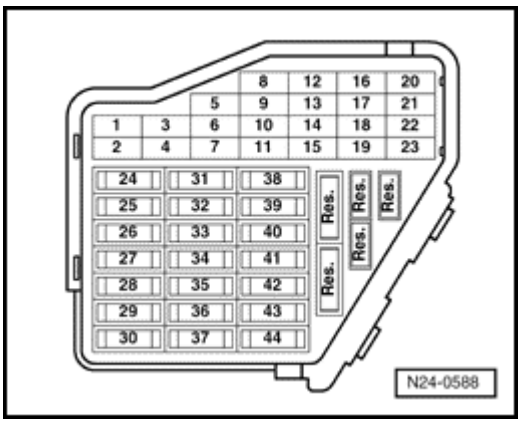
⇒ **Repair Manual, *2.8 Liter VR6 OBD II Fuel Injection & Ignition* , Repair Group 28**

- Remove spark plugs with spark plug tool 3122 B.



A

- Disconnect the 5-pin connector from the ignition coil (N152).



A

- Disconnect fuse no. 32 from the fuse block.

Notes:

By removing fuse 32, the voltage feed to the injector valves is interrupted.

- Completely depress accelerator pedal for wide open throttle.
- Check compression pressure with compression pressure tester V.A.G 1763.

Notes:

Handling the tester ⇒ user manual.

- Crank the engine until the tester no longer shows an increase in pressure.

Compression pressure readings:

New: 10-13 bar

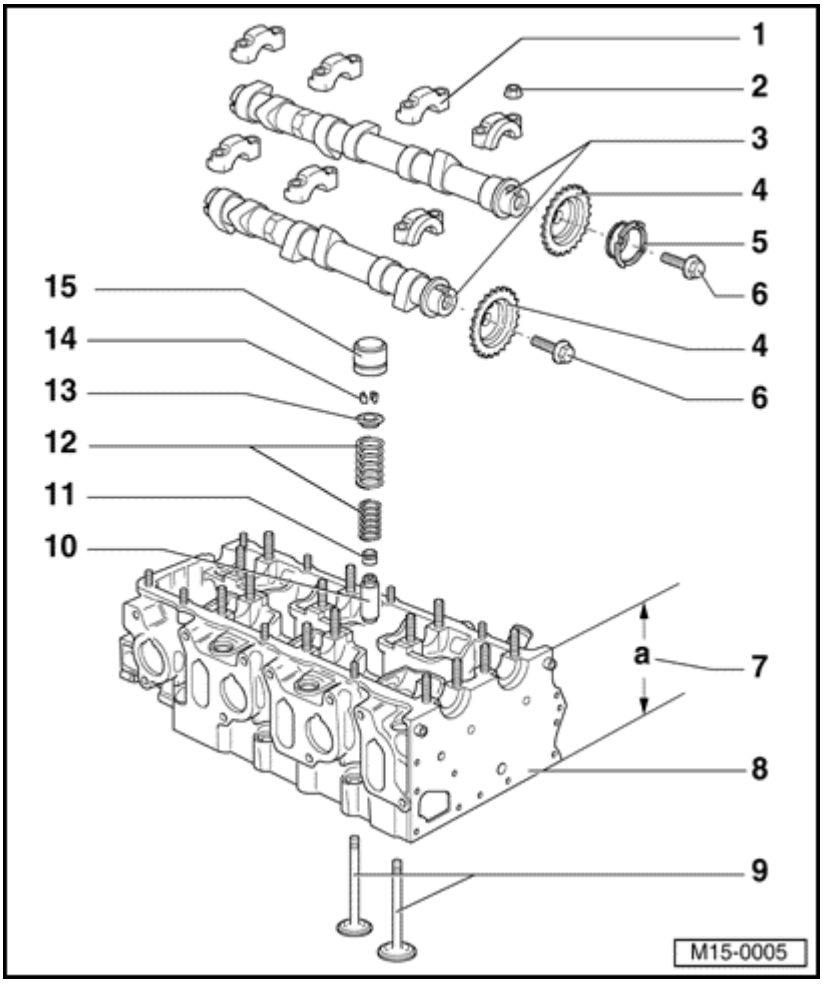
Max. wear: 7.5 bar

Permissible variation between all cylinders: 3 bar

Volkswagen Jetta, Golf, GTI 1999, 2000
2.8 Liter VR6 2V Engine Mechanical, Engine Code(s): AFP
Valve gear, repairing (Page 15-26)

Notes:

If cracks are small, and no more than 0.5 mm wide, cylinder heads with cracks between the valve seats or between the valve seat ring and the spark plug thread can continue to be used without a reduction in life.



1 - Bearing cover

- Installation position ⇒ Fig. 2
- Order of installation ⇒ page 15-34

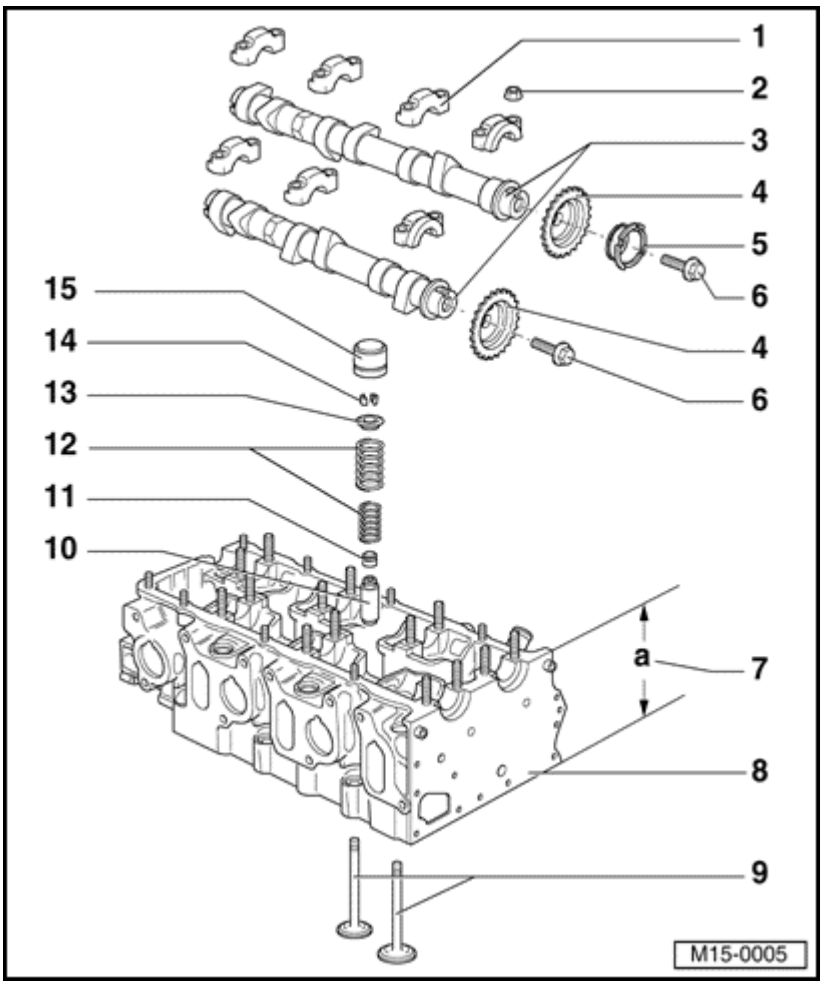
2 - 20 Nm

3 - Camshafts

- Checking axial clearance ⇒ Fig. 1
- Installing and removing ⇒ page 15-34
- Check radial clearance using Plastigage. Max. wear: 0.10 mm
- Runout: max. 0.01 mm

4 - Camshaft sprocket

- Removing and installing ⇒ page 15-34



5 - Pickup wheel

- For Hall generator (G40)
- Contact area at camshaft sprocket and pickup wheel must be dry during installation
- Removing and installing ⇒ page 15-34

6 - 100 Nm

- Place against camshaft using fork wrench SW 24 for removal and installation ⇒ page 15-34
- Oil screw head contact area during installation

7 - Cylinder head height

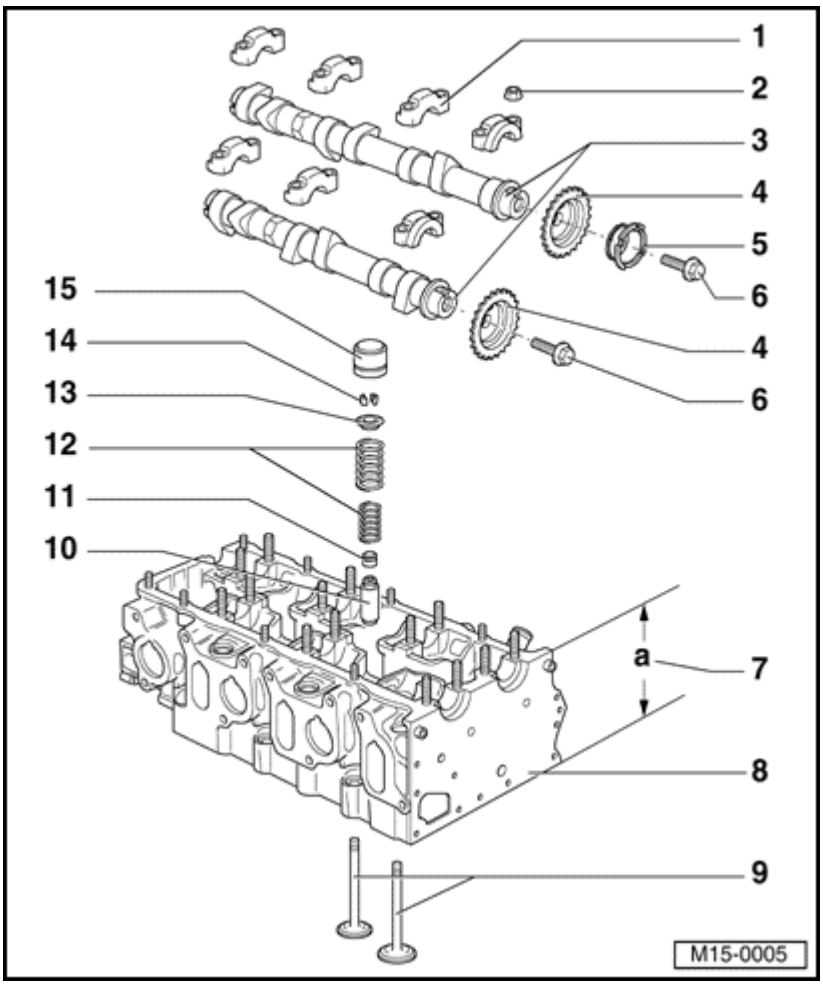
- Min. height: a = 139.5

8 - Cylinder head

- Observe Note ⇒ page 15-26
- Finishing valve seats ⇒ page 15-31

9 - Valves

- Do not finish, only grinding is allowable
- Valve measurements ⇒ Fig. 3



10 - Valve guide

- Checking ⇒ page 15-41
- Replacing ⇒ page 15-42
- Repair guide with collar

11 - Valve stem seal

- Replacing ⇒ page 15-44

12 - Valve springs

Removing and installing:

- With cylinder head removed: use 2037
- With cylinder head installed: ⇒ page 15-44

13 - Valve spring retainer

14 - Valve collets

15 - Valve lifters

- Do not mix up
- With hydraulic valve clearance balancing
- Checking ⇒ page 15-39
- For storage, lay down with the running face facing down

- Prior to installation, check camshaft axial clearance ⇒ Fig. 1
- Oil running face

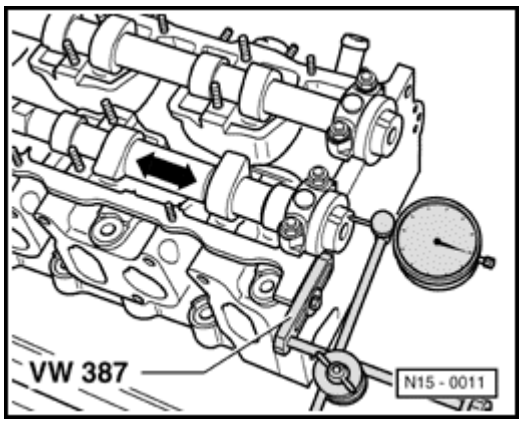


Fig. 1 Camshafts, checking axial clearance

Special tools, equipment, test and inspection devices; required accessories

- Universal gauge retainer VW 387
- Gauge

Test procedure

Max. wear: 0.15 mm

Measure with valve lifters removed and first and last bearing cover of each camshaft installed.

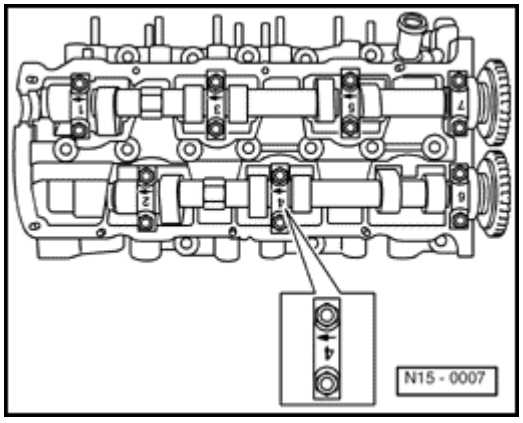


Fig. 2 Installation position camshaft bearing cover

The bearing cover markings (arrows) must point toward the oscillation damper side.

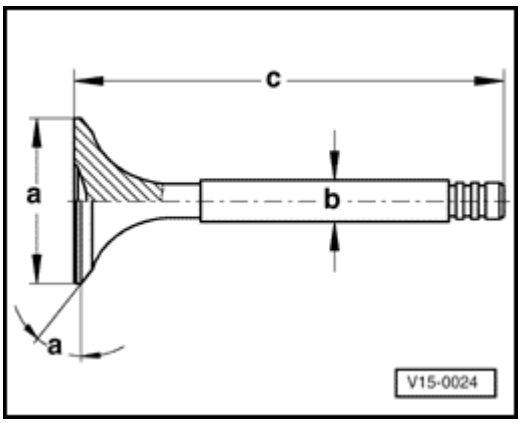


Fig. 3 Valve measurements

Notes:

Do not finish valves. Only grinding is allowable.

Measurement		Intake valve	Exhaust valve
Dia. a	mm	39.0	34.20
Dia. b	mm	6.97	6.95
c	mm	105.95	106.95
α	∠°	45	45

Valve seats, finishing

Necessary special tools, operating equipment, testers, gauges and other aids

- Depth gauge
- Valve seat finishing tool

Procedure

Notes:

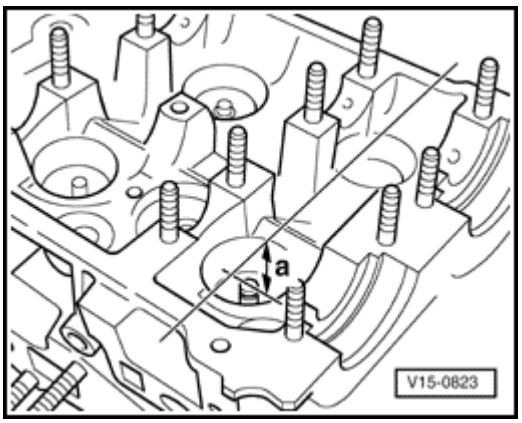
- *When repairing engines with leaking valves it is not sufficient to just work on or replace valve seats and valves. With longtime engines in particular it is necessary to check valve guides for wear.*
- *Only finish valve seats until a correct contact pattern is achieved. Before finishing valve seats you need to calculate the allowable finishing measurement. If this measurement is exceeded, correct functioning of the hydraulic valve clearance balancing cannot be guaranteed and you must replace the cylinder head.*

Calculating the maximum allowable finishing measurement

- Insert valve and press firmly against the valve seat.

Notes:

If the valve is being replaced during repairs, use a new valve for measuring.



A

- Measure distance -a- between valve stem end and upper edge of cylinder head.
- Calculate the maximum allowable finishing measurement from measured distance and minimum measurement.

Minimum measurements:

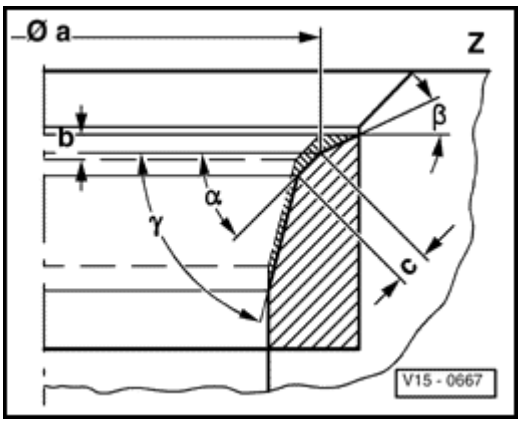
- Intake valve: 33.9 mm
- Exhaust valve: 34.1 mm

Measured distance -a- minus minimum measurement = max. allowable finishing measurement.

Example:

Measured distance -a-	34.8 mm
- minimum measurement	34.1 mm
= max. allow. finish. measurement 1)	0.7 mm

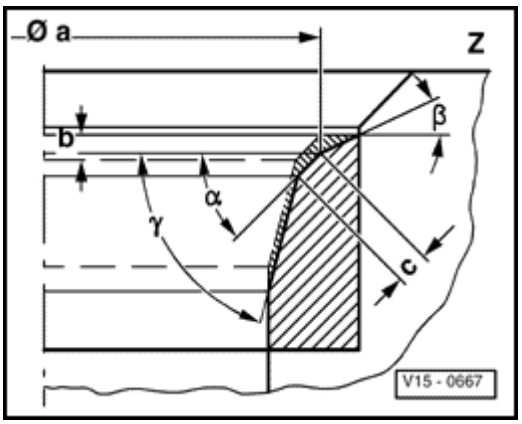
1) ⇒ page 15-33.



A

Finishing intake valve seat

a = dia. 38.3 mm
b = max. allowable finishing measurement
c = 1.4-2.0 mm
If necessary, finish valve seat ring with 75° valve reseating tool
Z = bottom edge of cylinder head
α = 45° valve seat angle
β = 30° correction angle upper
γ = 60° correction angle lower



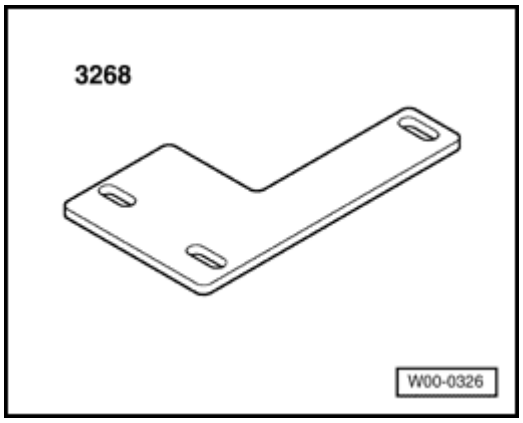
A

Finishing exhaust valve seat

a = dia. 33.5 mm
b = max. allowable finishing measurement
c = 2.0 mm-2.5 mm
If necessary, finish valve seat ring with 75° valve reseating tool
Z = bottom edge of cylinder head
α = 45° valve seat angle
β = 30° correction angle upper
γ = 73° correction angle lower

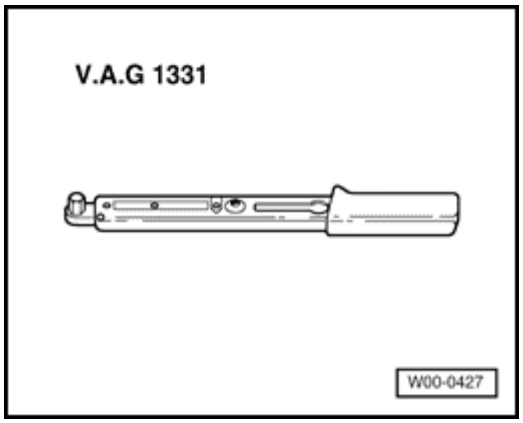
Camshafts, removing and installing

Special tools, equipment, test and inspection devices; required accessories



A

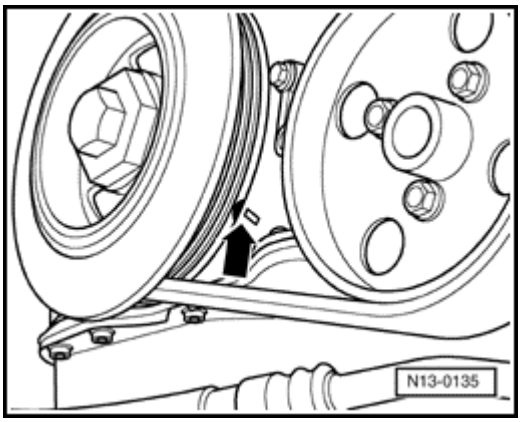
- Camshaft ruler 3268



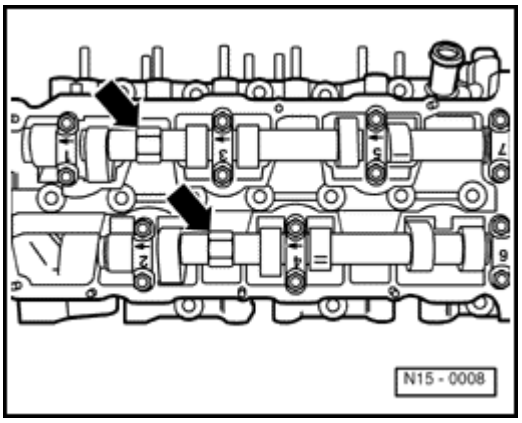
A

- Torque wrench V.A.G 1331 (5-50 Nm)

Removing



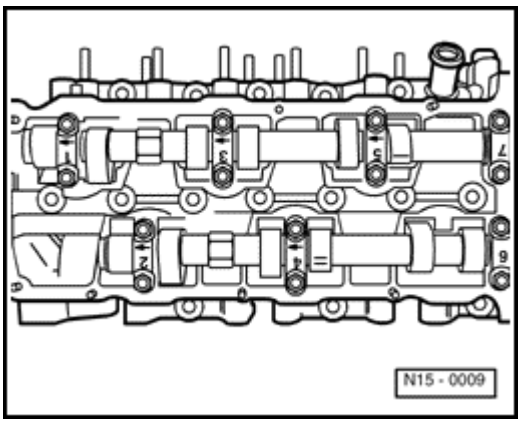
- Turn camshaft in engine turning direction to marker TDC cyl. 1 -arrow- at the oscillation damper retainer screw.
- Remove ignition coil (N152).
- Remove camshaft roller chain tensioner.
- Remove cover.
- Loosen fastening screws at the camshaft sprockets.



Notes:

Use only fork wrench SW 24 to place against camshaft -arrow-. The camshaft ruler 3268 must not be inserted when tightening or loosening the sprockets.

- Remove camshaft sprockets.



A

Camshaft, cylinder row 1, 3 and 5

- Remove bearing covers 1 and 7 first.
- Loosen bearing covers 3 and 5 in an alternating and crosswise pattern.

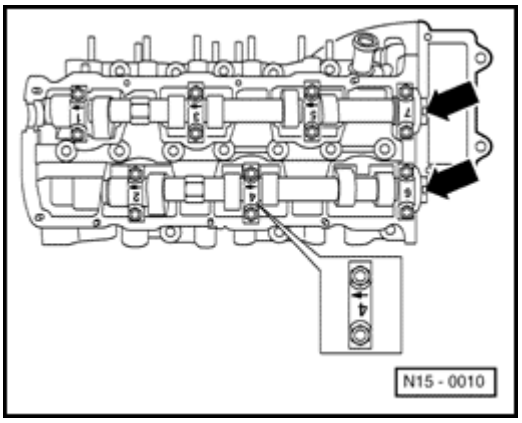
Camshaft, cylinder row 2, 4 and 6

- Remove bearing cover 4 first.
- Loosen bearing covers 2 and 6 in an alternating and crosswise pattern.

Installing

- Oil camshaft running faces.

Notes:



A

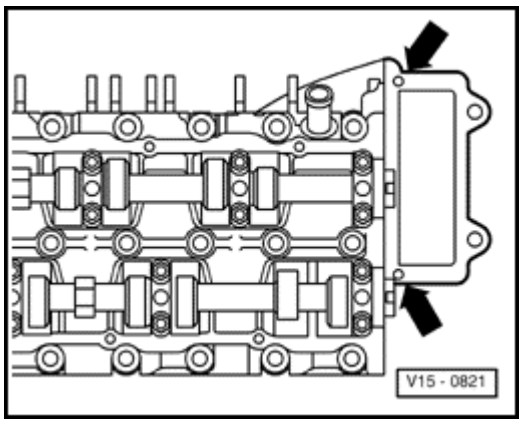
- *During camshaft installation, the camshaft sprocket recesses -arrows- must point upward.*
- *Make sure that during bearing cover installation the markings on the covers are visible from the exhaust side of the cylinder head, and that the arrows point in the direction of the oscillation damper side.*

Camshaft, cylinder row 1, 3 and 5

- Tighten bearing covers 3 and 5 in an alternating and crosswise pattern and then finish tightening to 20 Nm.
- Install bearing covers 1 and 7 and also tighten to 20 Nm.

Camshaft, cylinder row 2, 4 and 6

- Tighten bearing covers 2 and 6 in an alternating and crosswise pattern and then finish tightening to 20 Nm.
- Install bearing cover 4 and also tighten to 20 Nm.
- Clean camshaft gear cover at the sealing surfaces and at the cylinder head.



A

- Clean old sealant from 3 mm bores in the cylinder head gasket.

Notes:

With the cylinder head installed, the bores in the cylinder head gasket are only partially visible.

- Install camshaft sprockets with camshaft roller chain ⇒ page 13-10 , adjust timing.
- Fill 3 mm bores in the cylinder head gasket with sealant AMV 188 001 02.
- Coat cover sealing surface with AMV 188 001 02.

Notes:

Make sure that the oil duct sealing O-ring is seated in the cover.

- Install cover, start all fastening screws and lightly tighten by hand.
- First tighten the M8 fastening screws to 25 Nm, then tighten the M6 fastening screws to 10 Nm.
- Install camshaft roller chain tensioner and tighten to 30 Nm.

Notes:

After installing new valve lifters, do not start the engine until after about 30 minutes. Hydraulic balancing elements must become properly seated (otherwise, valves will make contact with the piston).

Checking hydraulic lifters

Special tools, equipment, test and inspection devices; required accessories

- Feeler gauge
- Wooden or plastic wedge

Test procedure

Notes:

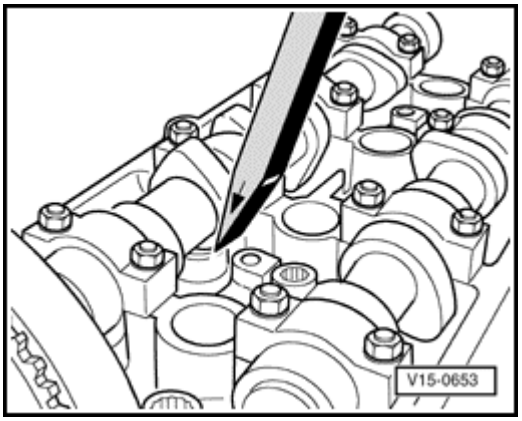
- *Valve lifters must be replaced as units (they cannot be adjusted or repaired).*
- *Intermittent valve noises during engine startup are normal.*

- Start the engine and let it run until the radiator fan has turned on once.
- Increase the engine speed to approximately 2500 rpm for 2 minutes.

If the hydraulic lifters continue to make noise, find the faulty lifter as follows:

- Remove the cylinder head cover ⇒ page 15-8.
- Turn the camshaft at the oscillating damper fastening screw clockwise until the valve lifter cams being tested are in the upper position.

- Determine the clearance between cams and valve lifters.
- If the clearance is greater than 0.2 mm, replace the valve lifters. If the clearance is less then 0.1 mm or no clearance is determined, continue the test as follows:



A

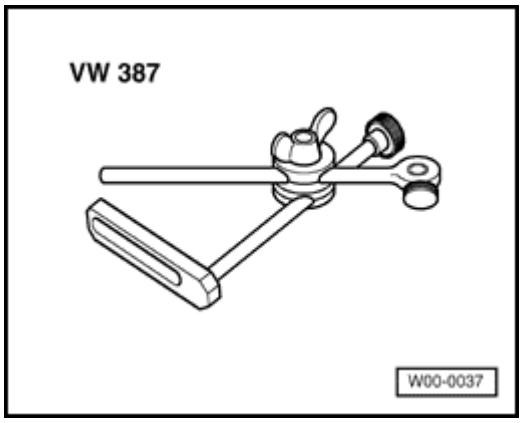
- Push the valve lifters downward with a wooden or plastic wedge. If you can feel unrestricted motion of more than 0.2 mm until the valve opens, replace lifters.

Notes:

After installing new valve lifters, do not start the engine until after about 30 minutes. Hydraulic balancing elements must become properly seated (otherwise, valves will make contact with the piston).

Valve guides, checking

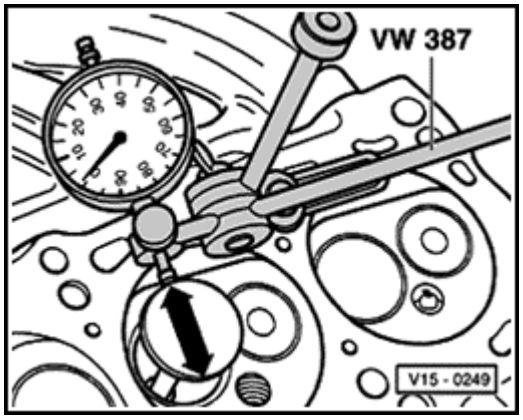
Special tools, equipment, test and inspection devices; required accessories



A

- Universal gauge retainer VW 387
- Gauge

Test procedure



A

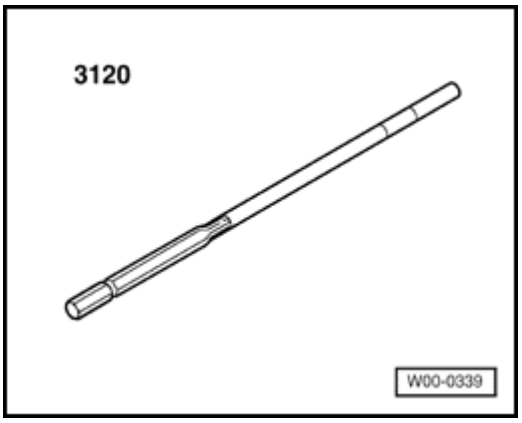
- Insert a new valve into the guide. Valve stem end must be flush with the guide. Because of the varying stem diameters, use only intake valves in intake guides and exhaust valves in exhaust guides.
- Determine tilt clearance.

Max. wear:

- Intake valve guide = 1.0 mm
- Exhaust valve guide = 1.3 mm

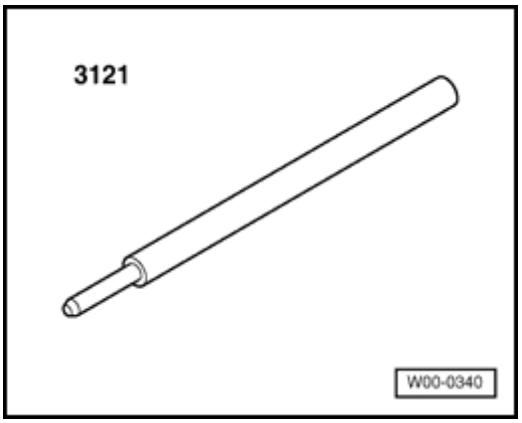
Valve guides, replacing

Special tools, equipment, test and inspection devices; required accessories



A

- Hand reamer 3120 and diluted soluble oil

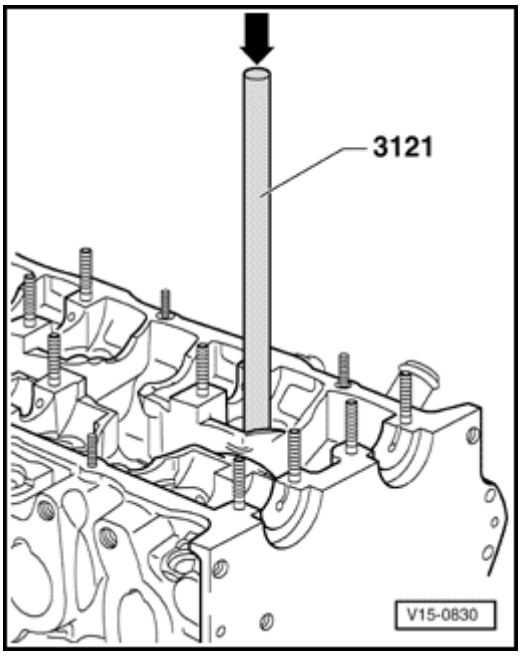


A

- 3121 Driver

Removing

- Clean and check cylinder head. Heads whose valve seat rings cannot be finished any further, or heads which have already been finished to the minimum measurement (height ⇒ page 15-27 , item -7-), or which already have KD valve guides installed, are unsuitable for valve guide replacement.



A

- Press worn valve guides out from the camshaft side by using driver 3121.

Installing

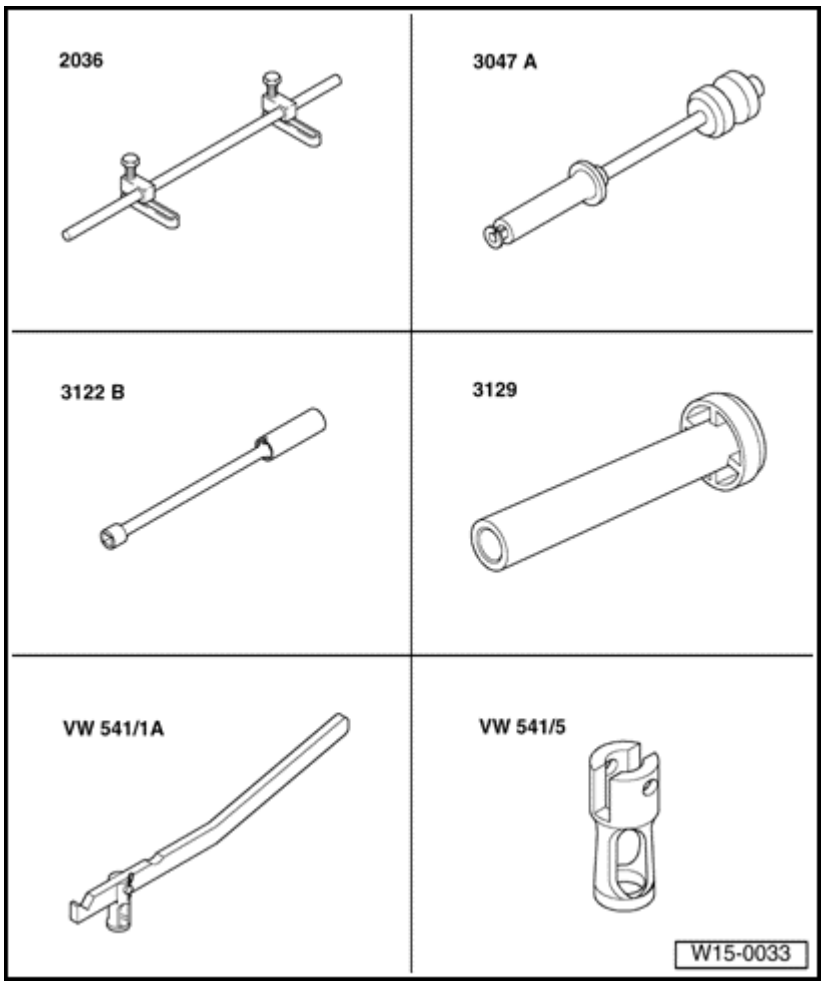
- Sprinkle new guides with oil and press them up to the sleeve into the cold cylinder head. The cylinder head must be laying down flat during this procedure.

Notes:

After the guide is in place with the sleeve, the pressure of pressing down cannot exceed 1.0 t, otherwise the sleeve might break off.

- Ream the valve guide with hand reamer 3120. You must use diluted soluble oil during this procedure.
- Finish valve seats ⇒ page 15-31.

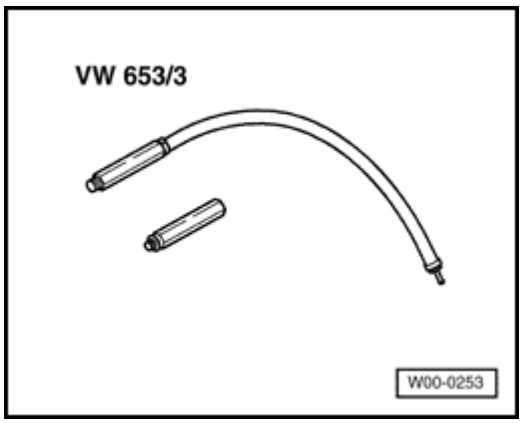
Valve stem seals, replacing



(Cylinder head installed)

Special tools, equipment, test and inspection devices; required accessories

- Mounting device 2036
- Extruder 3047 A
- Spark plug wrench 3122B
- Press down device 3129
- Mounting lever VW 541/1A
- Thrust piece VW 541/5

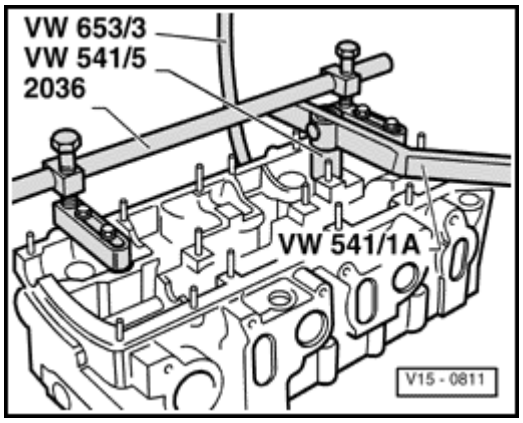


A

- Flexible pressure tubing VW 653/3

Removing

- Remove camshafts ⇒ page 15-34.
- Remove valve lifters (do not mix up) and place aside with the running face facing down.
- Remove spark plugs with spark plug wrench 3122 B.
- Bring the piston of each applicable cylinder into the "Bottom Dead Center" (BDC) position.



A

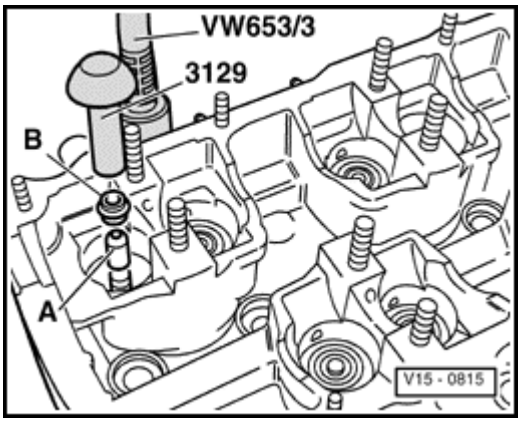
- Insert mounting device 2036 and adjust the bearing arrangement to the stud bolt height.
- Screw the flexible pressure tubing VW 653/3 into the spark plug thread and provide continuous pressure (min. 6 bar).
- Remove the valve springs with mounting lever VW 541/1A and thrust piece VW 541/5.

Notes:

Loosen binding valve collets (keepers) by applying light hammer blows to the mounting lever.

- Remove valve stem seals using extruder 3047 A.

Installing



- To avoid damage to the new valve stem seals, push plastic sleeve -A- onto the valve stem.
- Oil valve stem seal -B-, insert it into the press down device 3129 and carefully push onto the valve guide.